

# Case report of COVID-19 in pregnancy and viral presence in the vagina – recommendations for obstetric practice

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## Title page

**Title:** "Case report of COVID-19 in pregnancy and viral presence in the vagina – recommendations for obstetric practice"

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**Running title :** "COVID-19 in pregnancy and a positive vaginal swab"

## Case report

A 36-year old woman, para 3, and pregnant in gestational week 26+5 presented to the Emergency Department with shortness of breath and vomiting. She tested positive for SARS-CoV-2 by a pharyngeal swab and was admitted. She was a non-smoker, obese, and treated with Levothyroxine for hypothyroidism.

She had previously contacted the antenatal ward with vaginal bleeding in gestational week 24+5, and again at

25+1 with bleeding, in addition to headache, shortness of breath, and calf tenderness. Deep vein thrombosis of the left femoral vein was confirmed by ultrasound, and she started treatment with daily injections of Tinzaparin. The vaginal bleeding was from a varicose vein in the left labium minus. She had a negative pharyngeal swab for SARS-CoV-2 and as symptoms improved shortly thereafter she was discharged.

Eleven days later (26+5) she contacted the Emergency Department due to coughing, shortness of breath, and vomiting and was subsequently admitted to the Department of Cardiology, where she tested positive for SARS-CoV-2 in a pharyngeal swab. Her respiration rate was 22 breaths per minute, pulse 130 per minute, saturation of 97% without oxygen, and a temperature of 37.6 degrees Celsius. The following day (26+6) the obstetrician was asked for a consult and decided to do a vaginal swab for SARS-CoV-2, in case of need for urgent delivery. During admission there were normal fetal movements, a normal cardiotocography, and no signs of preeclampsia. Two vaginal swabs both came back positive. Cycle threshold values for all swabs can be seen in Table 1. Temperature had increased to 38.0 degrees Celsius, but as pulse decreased to 87 per minute and saturation increased to 99%, and there were no signs of severe COVID-19 infection or pulmonary embolism, she was discharged from the Department of Cardiology to recuperate at home. A couple of days thereafter, her partner and daughter tested positive for SARS-CoV-2. The patient had had coitus three or four days prior to testing positive for SARS-CoV-2 in the vaginal swab. A serum antibody test (VITROS Anti-SARS-CoV-2 total serology assay by Ortho Clinical Diagnostics) performed at week 26+6 gestation was negative for SARS-CoV-2 antibodies.

We followed up with the patient, with complete remission of symptoms in gestational week 28+0. A repeat pharyngeal swab in gestational week 29+0 was still positive but two vaginal swabs were negative. However, the serum antibody test had turned positive. In week 32+0 both pharyngeal and vaginal swabs were negative and serum antibody test still positive. The patient was clinically well with no signs of preeclampsia and with normal biophysical profile and growth of the fetus.

## Discussion

Despite very few reported cases of neonatal COVID-19, it is an ongoing discussion whether SARS-CoV-2 can be vertically transmitted from the mother to the child during labor. As symptomatic women with COVID-19 have often been delivered by caesarean section it is still difficult to evaluate whether vertical transmission is harmless or constitutes a potential threat to the newborn which could be prevented by delivery by caesarean section (1). Previously, three cohort studies with a total of 76 women, have reported three cases where SARS-CoV-2 was detected in vaginal swabs (4–6), where only one of the three women was pregnant.

We present a single case of a pregnant woman who was clinically affected by COVID-19 in week 26 gestation, where SARS-CoV-2 was also detected in two vaginal swabs. This case raises concern that SARS-CoV-2 could be vertically transmitted during labor, however the clinical implications of the findings should be discussed.

The cycle threshold values were markedly higher for the vaginal swabs than for the pharyngeal swabs, indicating that there was a lower presence of viral DNA. A week after the symptoms had resolved, SARS-CoV-2 could still be detected in a pharyngeal swab but not in vaginal swabs. This might imply that intrapartum transmission is most likely when the mother is symptomatic, and the infant is not yet protected by maternal antibodies.

In the present case, there are several potential sources for the viral presence in the vagina. Theoretically, the vaginal epithelium is not abundant in angiotensin-converting enzyme 2 (ACE2) receptors, but they are upregulated during pregnancy (2). Hence, viral replication in the vaginal epithelium itself is possible as the coronavirus binds to their target cells through the ACE2 receptors. Further, as the patient was being treated with anticoagulants at the time and had a history of vaginal bleeding during pregnancy, it is possible that viral RNA was being exudated from the blood stream, instead of actually being released by the vaginal epithelium itself. There is also potential of seminal contamination (3), however the patient had had coitus three to four days before the vaginal swab and her partner first tested positive a couple of days after the patient experienced the first symptoms.

Despite the risk of vertical transmission of COVID-19 during labor presumably being low (7,8) and with infants being very likely to have a mild course of the disease should they become infected (1), we recommend all women testing positive for SARS-CoV-2 in pharyngeal swabs to be routinely tested with a vaginal swab to gain more knowledge regarding presence and level of the viral load in both symptomatic and asymptomatic women with active COVID-19 infection. We also suggest that mode of delivery should be discussed with women at risk of going into labor with a recently discovered COVID-19 infection, where passive immunity of the baby is unlikely, especially in more severe cases, where caesarean section may be preferable due to potentially higher viral load in the vagina.

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### **Disclosure of Interests:**

All authors report no conflicts of interest.

### **Contribution to Authorship:**

TDC conceived the presentation of the case report. PA wrote the first manuscript draft with subsequent amendments and critical feedback by TDC, ECLL, VMFH, JM, JMB, and LR. LR performed antibody analyses. VMFH and JM followed up with the patient with additional vaginal and pharyngeal swabs. All authors approved the final version of the manuscript.

### **Details of Ethics Approval:**

The patient has given verbal and written consent to have her case published in BJOG.

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### Table Caption List:

Table 1: Course of patient HS's COVID-19 infection and results of pharyngeal and vaginal swabs, as well as antibody tests.

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Table1.docx available at <https://authorea.com/users/469115/articles/562204-case-report-of-covid-19-in-pregnancy-and-viral-presence-in-the-vagina-recommendations-for-obstetric-practice>